

REMARKS

In response to the Office Action mailed on January 24, 2006, Applicants respectfully request reconsideration. To further the prosecution of this Application, Applicants submit the following remarks discussing patentability of rejected claims 1-50. Applicants respectfully request that the application be passed to issue.

Claims 1-50 were previously pending in the subject Application. The following remarks address the rejections of claims 1-50 as set out in the present Office Action. Applicants have not amended the pending claims because the final office action fails to address the Applicants arguments in the reply to the last office action.

Summary of an Embodiment of the Invention

Prior to discussion of the pending claims, Applicants would like to briefly discuss an illustrative embodiment of the present invention. One embodiment of the present invention, in contrast to conventional approaches, is directed to techniques for forwarding a request, such as an HTTP request initiated by a client computer, from a network device equipped with the invention, such as a content switch, to a web cache (or other content delivery device such as a web server) that provides a response back to the client without requiring the response to pass through the switch.

As one example approach of the invention, a network device initially receiving the request, such as a content switch or router, can use a special protocol called a "Heads Up Switching Protocol (HUSP)" to forward the request to the web cache along with additional request information that can include source and destination IP addresses of the request, port information, TCP sequence numbers, client window information (e.g., TCP window information for receiving data), and other related request information, such as HTTP header information all based upon the initial request. The web cache can then use this request information to return content directly back to the client in a HUSP response that is sent to the client without passing through the switch. Thus, the content switch is not burdened with handling all of the responses, and the responses are not

delayed due to passing through the content switch. In addition, the HUSP provides a request sequence number that facilitates returning responses from multiple requests by the client in the proper sequence. Thus, the client can provide multiple requests (i.e., pipelined requests) over the same connection to the content switch and can receive responses from the web cache (or other content delivery device) in the same order that the requests were made, without requiring the client to wait until receiving the response to each request before sending another request.

Rejections of Claims 1-36 under 35 U.S.C. § 103(a)

The Examiner has rejected claim 1 under 35 U.S.C. § 103(a) based on the teachings of Brendel et. al, (U.S. Patent 5,774,660) in view of Illnicki, (US. Patent 6,751,677). Applicants are appreciative of the Examiner's review of pending claim 1 and respectfully request further consideration of same in view of the following discussion pointing out why claim 1 is unique and non-obvious over even the combination of cited prior art.

In the Final Office Action, the Examiner argues that Illnicki teaches the claim limitation of "providing a data transfer approval to the data access device in response to receiving the first response, the data transfer approval authorizing the data access device to establish the communication connection to the client based on the connection establishment information and provide a second response to the second request to the client." Applicants respectfully disagree with this assertion and respectfully request the Examiner to reconsider grounds of the rejection because they are improper.

For example, the Examiner argues that figure 5 of Illnicki illustrates a secure SSL connection between a user terminal (client) and a target server. The Examiner states that the user terminal sends a request to a gateway. The Examiner further states that gateway authenticates the client, which later allows the client to connect to the target server. The Examiner interprets the authentication as providing a data transfer approval.

In order to establish a *prima facie* case of obviousness, the Office Action must meet three criteria.

“First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.”

In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)

In view of this well-accepted precedent, Applicants submit that the current rejection is improper for a number of reasons. First, there is no motivation or suggestion to combine the references to produce that the claimed invention. This argument was set out in the reply to the last office action. The Examiner fails to provide any arguments or motivation as to why the references are combinable in rebuttal to these arguments. Applicants submit that Illnicki teaches away from the claimed invention. Accordingly, Illnicki and Brendel cannot be combined to reject the claimed invention and the Examiner has failed to present a *prima facie* case of obviousness.

For example, as previously submitted, the Examiner admits that Brendel does not disclose, teach or suggest the claim limitation of: “providing a data transfer approval to the data access device in response to receiving the first response, the data transfer approval authorizing the data access device to establish the communication connection to the client based on the connection establishment information and provide a second response to the second request to the client.” The Examiner contends that Illnicki suggests this claim limitation to produce the claimed invention. Applicants disagree with this assertion and respectfully traverse the rejection on the grounds that Illnicki teaches away from such a combination of references to produce the claimed invention.

For example, Illnicki does not forward the request (e.g., object invocation) from the gateway to the target server until after the gateway sets up a secure connection

between the user terminal and the target server through the gateway. Object invocation is a confidential communication in Illnicki. As shown in figure 5 of Illnicki, the gateway first authenticates the client. Thereafter, the gateway receives a "Hello" message from the user terminal that has been directed to the target server. The "Hello" message is not a request for data, but is instead an initial communication from the user terminal to invoke a secured connection.

As further shown in figure 5 of Illnicki, the gateway then authenticates and thereafter forwards the "Hello" message to the target server. The user terminal and the target server complete a handshake over the secured connection. Finally, the user terminal "invokes the target object" (e.g., sends the request) over the secured connection established by the gateway. See column 8, line 42 to column 9, line 9. At no time during this process does the gateway forward a data request to the target server prior to setting up the secured connection because doing so would put the communication at risk of being discovered. The whole purpose of setting up the secured link between the user terminal and the target server is to prevent non-authorized persons from discovering any data requests and corresponding retrieved data from a target server.

Accordingly, Applicants contend that Illnicki can not logically be combined to suggest the claimed invention because Illnicki goes through great lengths (e.g., an authentication process) to avoid sending a data request to a target server until after establishment of the secured connection. In contradistinction, claim 1 recites that the data communication device forwards the request for data as well as the connection establishment information to the data access device before providing the data transfer approval to the data access device. This means that the request for data in the claimed invention is sent to the data access device prior to authorizing the data access device to establish the connection between the data access device and the client. Illnicki therefore teaches away from the claimed invention. That is, there is no indication whatsoever in Illnicki to send an invocation to a target object prior to establishment of a

connection between the user terminal and target server. Instead Illnicki teaches that the request is forwarded from the user terminal to the target server after the secured link has been established. Accordingly, there is no motivation or suggestion to combine Illnicki and Brendel. Nor does the combination teach or suggest every claim limitation.

One of ordinary skill in the art may use the technique in Illnicki to set up a secure network connection through a gateway. However, there is no indication in either reference that a data communication device forward "connection establishment information" and thereafter provide a simple "data transfer approval" technique of authorizing a server to service a respective request. Accordingly, the Examiner has not set forth a prima facie case of obviousness and Applicants respectfully request allowance of claim 1.

Second, the claimed invention includes limitations not found in either cited reference. The Examiner admits that Brendel does not expressly teach or suggest the fourth element of "providing a data transfer approval to the data access device in response to receiving the first response, the data transfer approval authorizing the data access device to establish the communication connection to the client based on the connection establishment information and provide a second response to the second request to the client." For this claim limitation, the Examiner cites the title, abstract, FIG. 5, and several passages in Illnicki.

Applicants respectfully submit that Illnicki does not teach or suggest this claim limitation either. For example, the Examiner argues that the Illnicki authenticates the target and thereafter forwards the SSL Hello message to the target server. The server in Illnicki completes an SSL handshake with the user terminal. Accordingly, Illnicki discloses a conventional technique of supporting an initial setup of a path between a client and a target. Thereafter, the request for data is sent to the server for execution.

The claimed invention recites an opposite ordering of communication events as Illnicki. For example, the claimed invention recites sending the request including connection establishment information to the server first. Thereafter, the data communication device of the claimed invention sends an approval authorizing a data access device to establish a communication connection to a client based on previously sent connection establishment information. Accordingly, both Brendel and Illnicki teach away from the claimed invention.

Applicants submit that claim 1 is patentable because it recites a novel and useful technique never used in or even suggested by the prior art. For example, the technique of providing the data transfer approval in response to the communication from the data access device provides a unique "query-response" way of restricting the data access device from servicing a received request (even though it already has the information to establish a respective connection) until after receiving final approval from the data communication device. Brendel does not recite any way at all to address the issue of final approval at all. Illnicki merely discloses a way of enabling a user terminal to establish a secured connection with a target server through a gateway. Neither reference discloses this simple data transfer approval method.

Based on the aforementioned remarks, Applicants respectfully submit that the invention as recited in claim 1 is neither anticipated nor obvious because it includes a unique and useful configuration not taught or suggested by Brendel, Illnicki or any other reference of record. Thus, in view of the foregoing discussion, Applicants submit that claim 1 in its original form is patentably distinct and advantageous over the cited prior art, and the obviousness rejection should be withdrawn. Accordingly, allowance of claim 1 as well as corresponding dependent claims 2-10 and 37-40 is respectfully requested.

Claims 11, 21, and 22 include similar limitations as recited in claim 1 above. For applicable reasons as discussed above, claim 10 and corresponding dependent claims 12-20, 37-40, and 45-50 are patentably distinct over the cited prior art.

Regarding claim 3, the Examiner argues that Brendel discloses use of sequence numbers associated with respective TCP/IP data packets. However, as stated in the last office action reply, this is not what Applicants are claiming as their invention. The claimed invention is directed towards utilizing "request sequence numbers" for purposes of managing a sequence of requests and data transfer approvals. The cited passage in Brendel does not teach or suggest managing a sequence of requests nor does it teach or suggest managing a sequence of corresponding data transfer approvals. Applicants respectfully contend that there is no indication whatsoever in Brendel that each of multiple successive requests includes a request sequence number to distinguish it from the other requests. Accordingly, Applicants contend that the Examiner uses limitations of claim 3 to reject the claimed invention.

For example, claim 3 includes limitations of "receiving a plurality of first requests to access data from the client;" "providing a plurality of second requests in response to receiving the first requests, each second request including a request sequence number;" and "providing a data transfer approval for each of a plurality of responses to the second requests in a sequence based on the request sequence numbers for the second requests."

The Examiner cites additional passages in Brendel and Illnicki to reject claim 3. For example, the Examiner contends that Brendel discloses that a sequence number is also included in a TCP/IP header to keep track of received packets (column 10, lines 31-32). The Examiner cites Brendel at column 12 lines 7-24. Applicants respectfully submit that both of these passages refer to inclusion of conventional TCP/IP sequence numbers associated with multiple packets in one respective communication with the server. That is, Brendel describes how to use sequence numbers to identify portions of

communications associated with a same request message. There is no indication whatsoever that that each request includes a request sequence number to distinguish it from the other requests.

In contradistinction, the claimed invention uses sequence numbers to identify that a particular request is one of a sequence of multiple requests received by the data communication device. This enables the data communication device and data access device to more easily keep track of multiple requests and speed up communications. That is, the data communication device and data access device can use the sequence number to identify which request of multiple requests the message pertains. The cited reference provides no indication of this technique because the reference does not address the same communication issue. Illnicki also does not teach use of sequence numbers as in the claimed invention. Applicants therefore respectfully request allowance of dependent claims 3 and 13. Note that newly added claim 45 is allowable for similar reasons.

Applicants traverse the rejection of claim 4 on grounds that the cited figures and text do not teach or suggest every claim limitation. For example, the load balancer 54 in Brendel receives a URL from client 10 and forwards the URL to server 52. Server 52 of Brendel then serves web pages to client 10. The Examiner has not pointed out any language in Brendel indicating that the load balancer sends multiple requests to respective servers for a single received request from a client. In contradistinction to the cited prior art, the claimed invention recites, for a single received first request, providing multiple second requests to multiple data access devices and thereafter receiving responses from the multiple data access devices. The load balancer in Brendel does not receive multiple responses from multiple servers. Nor does the load balancer in Brendel choose one of multiple responding servers in which to provide a data transfer approval. Thus, Brendel does not teach or suggest the claimed invention. The cited reference only discloses forwarding a request to a single server and serving data to a

requesting client. Accordingly, Applicants also respectfully request allowance of claim 4 because it recites limitations not taught or suggested by Brendel or Illnicki.

Regarding claim 5 (which depends from claim 4), contrary to the Examiner's assertion, there is no indication that load balancer in Brendel sends a request to multiple servers and the servers respond with usage information associated with the servers. There is additionally no indication in Brendel that the load balancer receives communications from multiple servers. Accordingly, Applicants also respectfully request allowance of claim 5 because it recites limitations not taught or suggested by Brendel or Illnicki.

Regarding claim 6, contrary to the Examiner's assertion, mere use of a frame checksum in Brendel does not suggest a transmit window as in the claimed invention. For example, a frame checksum is an error detection mechanism used in order to determine whether a packet transmission failure occurs during a communication. According to one source, checksum is defined as:

"A simple error-detection scheme in which each transmitted message is accompanied by a numerical value based on the number of set bits in the message. The receiving station then applies the same formula to the message and checks to make sure the accompanying numerical value is the same. If not, the receiver can assume that the message has been garbled."

The "current transmit window" in the claimed invention is not used for detection of failures but is instead used to provide a window length for transmitting the second response to the client. Accordingly, the Examiner provides no support for the pending rejection and the Applicants also respectfully request allowance of claim 6 because it recites limitations not taught or suggested by Brendel or Illnicki.

Regarding claim 7, Applicants again submit that there is no indication in the cited passage that the load balancer notifies a respective server of a client to serve data and a “backup” location identifier of a server that can serve the data if the respective server is unable to service the client. Instead, the cited passage in Brendel merely indicates that two separate connections can be made to provide a backup path in case one path happens to fail. Use of a backup connection in Brendel does not suggest specific use of a backup location identifier as in the claimed invention. Applicants therefore respectfully request allowance of claim 7 or cite proper language in the prior art teaching or suggesting such a technique.

Regarding claim 9, the cited passage in Brendel at column 12 lines 7-29 does not disclose the limitations recited in claim 9. For example, the cited passage indicates a standard handshake between the client and the load balancer as indicated at column 12, lines 23-24. Applicants submit that claim 9 recites that the data communication device receives an ACK from the client indicating that the client received a communication from the data access device. Further, claim 9 recites that the data communications device sends an ACK to the data access device so that the data access device receives feedback that the client received the communication from the data access device. There is no mention in the cited reference that the load balancer sends the server an acknowledgment that the client received a message from the server. Applicants therefore respectfully request the Examiner identify such a specific teaching in the references or allow the claim.

Regarding claim 10, the cited passage in Brendel at column 12 line 59 to column 13 line 4 does not disclose the limitations recited in claim 9. In fact, the cited passage teaches away from the claimed invention because it recites a technique of a server not closing a connection. Accordingly, Applicants therefore respectfully request the Examiner identify such a specific teaching in the references or allow claim 10.

Claims 11-20, claims 23-28, and claims 29-34 should be allowable for similar reasons as claims 1-10.

Regarding claims 39 and 43, the Examiner asserts that Brendel at column 10, lines 30-34 discloses use of sequence numbers. Applicants respectfully submit that the sequence numbers in Brendel keep track of received packets, not different requests as in the claimed invention. Claims 39 and 43 recite utilization of a sequence number for facilitating servicing of multiple requests from the client to the data communication device. Neither reference discloses this technique of ordering requests. For example, the Examiner cites passages indicating that Brendel uses sequence numbers to label packets for transmission of a file. Thus, the use of sequence numbers in Brendel as well as the prior art in general is not the same or suggestive of the invention. Applicants therefore request allowance of claim 39 and 43.

Claim 40 recites a specific type of bidding process according to an embodiment of the invention. Neither reference discloses this unique technique of bidding for servicing, especially in the context of servicing the requests other than via communications through the data communication device. For example, Brendel only recites that the load balancer determines which server is best suited to serve the request. There is no indication that the load balancer sends performs a bidding process with each server. Thus, Applicants request allowance of claim 40.

Claims 23, 29, 35, and 36 as filed are written from the perspective of a data access device receiving a client request from a data communication device. Claims 23, 29, 35 and 36 include analogous limitations as in claim 1 and are patentably distinct over the cited prior art for similar reasons. Applicants therefore request allowance of claims 23, 29, 35, and 36 as well as respective dependent claims 24-28 and 30-34.

Regarding claim 44, the Examiner asserts that figure 11 of Brendel teaches the claimed invention. Applicants respectfully submit that the cited figure only indicates that the server receiving a request provides an acknowledgment back to the load-balancer. Thus, the load-balancer uses the acknowledgment to learn that the server received the request, not that the server can handle the request. Accordingly, the cited passage

does not teach or suggest the claimed invention and Applicants respectfully request allowance of claim 44.

Claim 45 includes similar limitations as discussed above regarding request sequence numbers and should be allowable for similar reasons.

Regarding claim 46, the Examiner asserts that figure 10 of Brendel teaches the claimed invention. Applicants respectfully submit that the cited figure only indicates that the load balancer performs load-balancing. There is no indication that the load-balancer communicates with the servers and receives messages from the servers, especially in response to receiving a request from a browser (e.g., client) for a webpage. Brendel at column 9 lines 30-33 states that load-balancer 54 keeps track of which requests are being processed by each server in a server farm. This is not equivalent to the claimed invention. Accordingly, the cited passage does not teach or suggest the claimed invention and Applicants respectfully request allowance of claim 46.

Claim 47 indicates that the data communication device forwards the request for data to the data access device prior to establishing of a connection between the data access device and the client. As shown in figure 11A, and as discussed in corresponding text in Brendel, the ordering of forwarding a request and establishing a connection occur in an opposite order as in the claimed invention. That is, Brendel discloses that the load balancer facilitates setting up a connection in step 102 and step 120 and thereafter passes through "a first request" to the server in step 104. For example, step 120 indicates a "server connected to a client." Step 104 indicates a "pass through of first user request to the server." The server then responds to the request by the client. Brendel emphasizes that these two processes are not commingled via the dotted line between the two processes. The claimed invention recites an opposite technique. For example, the claimed invention involves forwarding the data request (e.g., indication of the data requested by the client) to the data access device first and thereafter authorizing the data access device to establish a connection

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with the client. See Brendel column 11, lines 50-63. Also see Brendel at column 12 lines 46-58. Brendel therefore teaches away from the claimed invention. Thus, Applicants request allowance of claim 47.

For reasons discussed above, claim 48 (which depends from claim 47) includes use of request sequence numbers not mentioned by the cited references. Thus, Applicants request allowance of claim 48.

Regarding claim 49, Brendel does not address the issue of receiving multiple requests from the same client and therefore does not teach or suggest the claimed invention. Thus, Applicants request allowance of claim 49.

Regarding claim 50, neither Brendel nor Illnicki teach or suggest the individual limitations in other dependent claims as discussed above nor do they teach or suggest a combination of the claim limitations discussed above. Thus, Applicants request allowance of claim 50.

CONCLUSION

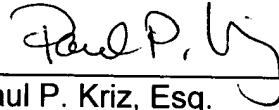
In view of the foregoing remarks, Applicants submit that the pending claims are in condition for allowance. A Notice to this affect is respectfully requested. If the Examiner believes, after reviewing this Response, that the pending claims are not in condition for allowance, the Examiner is respectfully requested to call the Applicant(s) Representative at the number below.

If there is a fee occasioned by this response, including an extension fee, that is not covered by an enclosed check, please charge any deficiency to Deposit Account No. 50-3735.

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If the enclosed papers or fees are considered incomplete, the Patent Office is respectfully requested to contact the undersigned Attorney at (508) 616-9660, in Westborough, Massachusetts.

Respectfully submitted,



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